requisite in the household to sterilise the full amount, and unless explicit directions on this point are given, smaller quantities will be treated, with the result indicated. With regard to the thermal death point of the tubercle bacillus, I am acquainted with the researches of Bang, Galtier, de Man, MacFadyean, and others. Undoubtedly 85° C. is a safe temperature, but the claim that the milk is unaltered in flavour and nutritive qualities thereby cannot be substantiated. In view of Theobald Smith's most careful work, which, so far as I know, has not been challenged, it seems that, provided the milk be heated in a closed vessel so that no skin forms on the surface, pasteurisation at 68° C. for 20 minutes will kill the tubercle bacillus with certainty, and this treatment but slightly alters the flavour of the milk. It may be wise to select the higher temperature, but it should not be stated that the milk is practically unaltered thereby. YOUR REVIEWER.

TYCHONIANA AT PRAGUE.[1]

ON October 24, 1901, three hundred years will have elapsed since the death of Tycho Brahe, and this memoir has been published in order to draw attention to that day and at the same time to give some account of the very few relics existing at Prague of the great astronomer, who spent his last years there and whose tomb is in the Teinkirche in that city. Print and illustrations of this memoir are excellent, but we could have wished that the text had been fuller and that at least one of the relics had been discussed in some detail. Tycho Brahe's instruments seem to have been destroyed during the Thirty Years' War, and not one of those he used at Uraniburg has been preserved; his library was scattered, but his manuscript observations fortunately found their way back to Denmark after having been thoroughly utilised by Kepler. The relics at Prague are therefore very modest ones—a few books from his library and a few manuscripts of no great importance. In the library of the Bohemian National Museum there is an album which Tycho gave his eldest son in 1599; on the first page of it is a portrait of the astronomer, reproduced in the present memoir. It is the well-known engraving by Geyn, coloured by hand. The book contains an autograph dedication by Tycho and a picture of his family arms, both of which Dr. Studnicka gives in facsimile. In the University Library there is a more important MS., containing on twenty leaves a short text-book on trigonometry, dated 1591. This was published in 1886 in photolithographic facsimile by Dr. Studnicka, who is exceedingly irritated with the writer of this review for having ventured to say that "Tycho has written his name under the title of the MS., but the handwriting of the remainder does not seem to be his." He even insinuates that the writer had perhaps never seen the facsimile reprint when he uttered this shocking heresy. The fact is, that the excellent reprint showed that the MS. in question was written in an extremely legible and distinct hand, while Tycho's astronomical MSS. in Copenhagen are anything but pleasant to wade through, and we are still of the opinion that it is very doubtful (to say the least) whether the MS. in question was written by Tycho himself. But this is really of no consequence, as nobody doubts that he is the author of it. The University Library also possesses a MS. copy of the table of sines of Copernicus, written by Tycho. Of much greater interest is a copy of the edition of Ptolemy's works of 1551, on the title-page of which Tycho has written that he bought it at Copenhagen on November 30, 1560, for two thaler. He was barely fourteen years of age when he obtained this standard work, and he made good use of it, as appears from the great number of marginal notes which he entered in it from time to time. We should have liked very much to have learned something about these notes, which doubtless would throw much light on the growth of the owner's knowledge, but

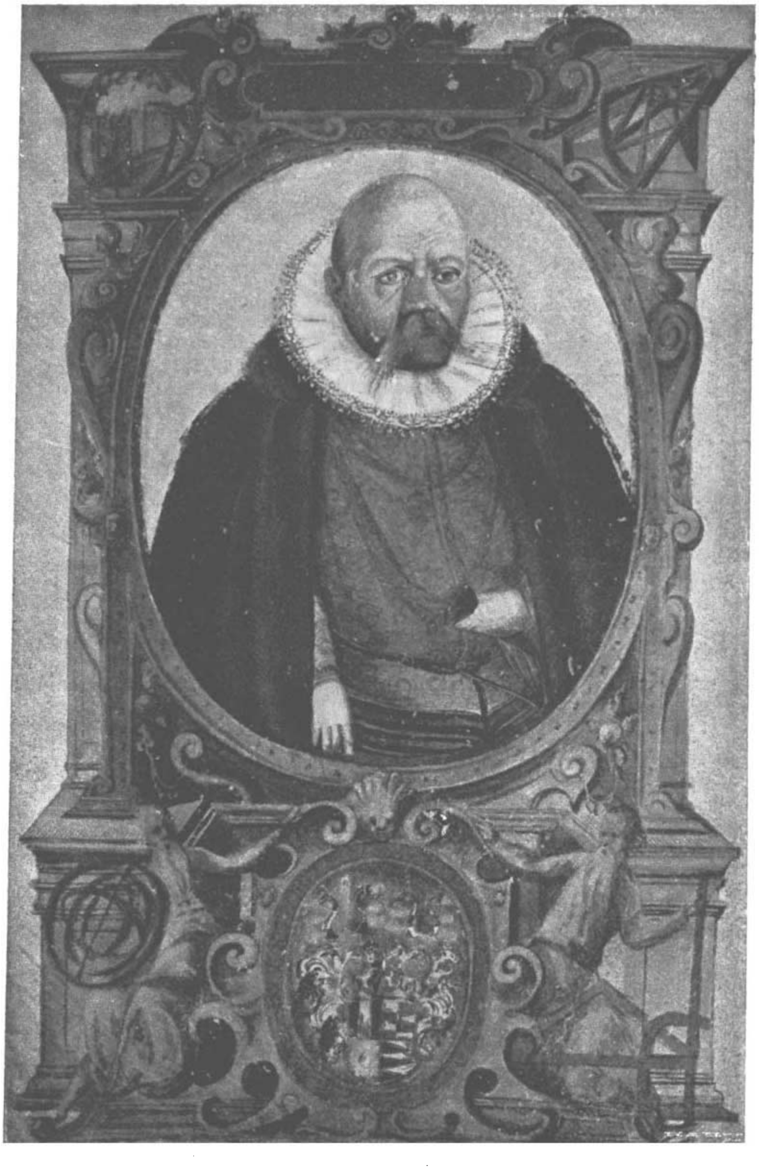

FIG. 1.—Portrait of Tycho Brahe.

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[1] "Prager Tychoniana." Gesammelt von Prof. Dr. F. I. Studnicka. 65 pp. 8vo, with a coloured frontispiece and illustrations in the text. (Prague, 1901.)

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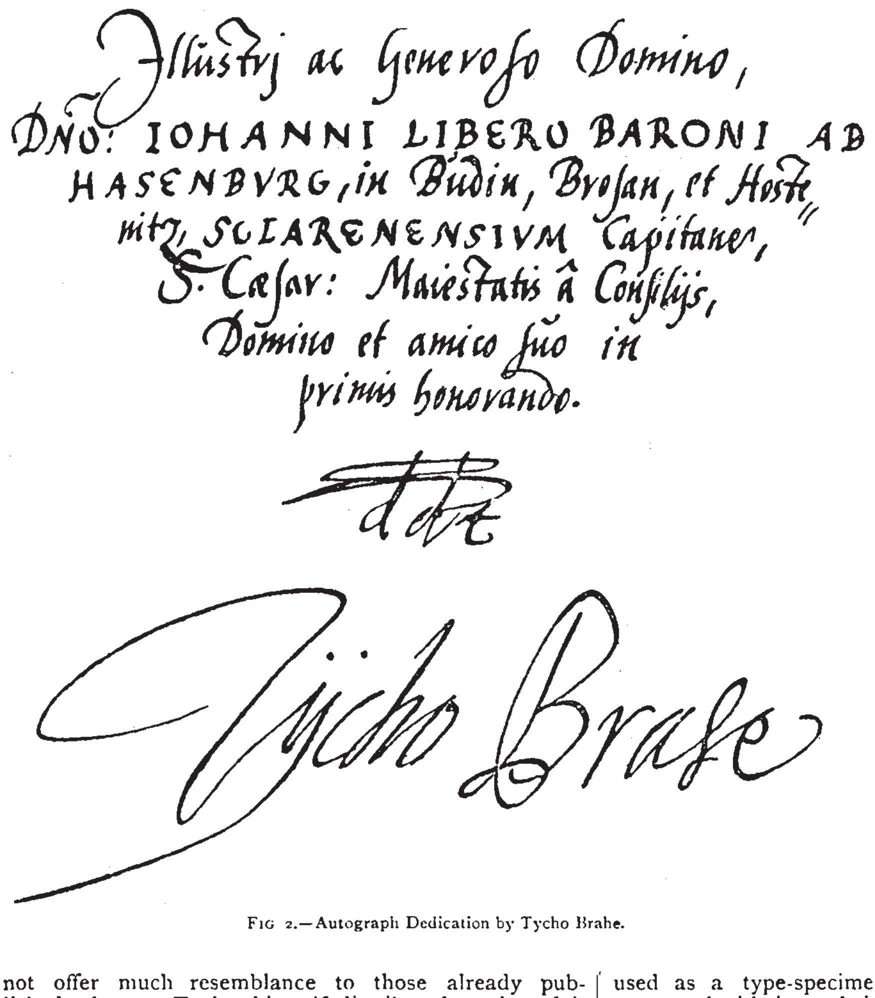
we are told nothing about the nature of the notes, nor about those written in a copy of the work of Copernicus (the Basle edition of 1566), which are also supposed to be in Tycho's hand.

One of the finest Tychoniana at Prague is a copy of the original edition of the "Astronomiæ Instauratæ Mechanica," printed (apparently in a small number of copies) in 1598. As in several other existing copies, the illustrations in this one have been coloured by hand, and there is a portrait inserted in it of which we are glad to be able to append a copy as well as a copy of the author's dedication to the Bohemian Baron von Hasenburg. As we have already remarked elsewhere ("Tycho Brahe," p. 263), this portrait does not offer much resemblance to those already published; but as Tycho himself distributed copies of it pasted into this magnificent book, we shall perhaps be justified in thinking that he considered it a good likeness.



Illustrj ac Generoso Domino,
Dno: IOHANNI LIBERO BARONI AB
HASENBVRG, in Budin, Brosan, et Hostitz, SCLARENENSIVM Capitaneo,
S. Cæsar: Maiestatis â Consilijs,
Domino et amico suo in
primis honorando.
ddt
Tÿcho Brahe

FIG 2.—Autograph Dedication by Tycho Brahe.

Finally, Dr. Studnicka gives a picture of a sextant made by Habermehl, of Prague, in 1600, and which tradition insists must have belonged to Tycho, though it has none of the characteristics of his own instruments. Though this memoir does not bring out any new facts, the numerous illustrations in it are very interesting, and it is a pleasant proof of the veneration in which the memory of the great astronomer is held in the country where he finished his career.

J. L. E. D.

PHYSIOGRAPHY AND PHYSICAL GEOGRAPHY.

THE progress of science, and human perversity, are jointly responsible for remarkable variations undergone by scientific words and terms with the lapse of time. Natural science, which once comprised all knowledge obtained by experiment and observation, now, as many think, only signifies natural history; physical science includes chemistry; physical astronomy is no longer the astronomy of Kepler, but that of the telescope and spectroscope; and physical geography is gradually assuming the name of physiography without acquiring the breadth of view which characterises this science. An article by Prof. W. M. Davis in the *School Review*, published by the University of Chicago Press, brings this nominal metamorphosis prominently before us. Prof. Davis defines physical geography—or physiography—which he considers as synonymous, as "the study of those features of the earth which are involved in the relation of earth and man; that is, the study of man's physical environment." So far as physical geography is concerned, this statement of its boundary lines is satisfactory, but when Prof. Davis uses the definition as a touchstone to test the character of physiography as understood by the examiners for the Department of Science and Art, he employs a criterion having no logical basis whatever.

Though, unfortunately for precision of scientific expression, physiography is often taken to mean physical geography, especially in the United States, the two departments of knowledge ought to be distinctly recognised as separate and fundamentally different in scope. It is perhaps a little late in the day to insist upon the distinction, for a hybrid has been produced which has commendable features and gives hopes of fertility; but what we do object to is that the hybrid is being used as a type-specimen, and its parents are being compared with it to their own detriment. To drop the metaphor, the physiography of South Kensington is criticised by Prof. Davis because it does not possess the points of virtue characteristic of physical geography in the sense understood by him. As he appears to be under a misapprehension as to the original use of the word and the scope of the subject—an obliquity shared, moreover, by many other physical geographers—it may be worth while to recall the circumstances which led to its adoption.

Until the year 1877 the Department of Science and Art held examinations in physical geography as generally understood. The Education Department also held

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